

ANNEX
BETWEEN
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER
AND OLD DOMINION UNIVERSITY
UNDER SPACE ACT UMBRELLA AGREEMENT
NO. 34376, DATED 5/3/2021 (ANNEX NUMBER 4-35097).

ARTICLE 1. PURPOSE

This Annex shall be for the purpose of collaboration between NASA Langley Research Center (LaRC) and Old Dominion University (ODU) to address research, development, testing and evaluation (RDT&E) associated with the conduct of unmanned aircraft systems (UAS) operations over the Chesapeake Bay and/or its tributaries. Collaboration will focus on the collection of images (e.g., photographs and/or video recordings) of surface water using a UAS vehicle's onboard imaging system(s) as well as the subsequent correlation of data obtained from those images with data obtained via the chemical and biological analysis of samples collected from the same body of water.

The legal authority for this Annex, consistent with the Umbrella Agreement, is in accordance with the Space Act, Other Transactions Authority (OTA), 51 U.S.C. § 20113(e).

ARTICLE 2. RESPONSIBILITIES

A. NASA LaRC will use reasonable efforts to:

1. Provide a UAS vehicle equipped with appropriate imaging system(s) as well as personnel to oversee and execute UAS flights conducted over local bodies of water. During these flights, images of surface water will be gathered, stored, and ultimately shared with the partner after approval for release by the NASA Langley Range Safety Officer.
2. Conduct a successful Operational Readiness Review, to include obtaining required waivers/approvals/authorizations from Langley Air Force Base (LAFB) and the Federal Aviation Administration (FAA), prior to conducting the first flight operation.
3. Work with the partner to develop a concept of operations/test plan to determine the most influential parameters and their optimum values to produce the best quality data.

B. Partner will use reasonable efforts to:

1. Provide personnel, affiliated with the Department of Ocean & Earth Sciences, to support surface water data collection activities, with the potential monitoring of harmful algal blooms (HABs) within local bodies of water being of primary interest.
2. Work with NASA LaRC to develop a concept of operations/test plan to determine the most influential parameters and their optimum values to produce the best quality data.
3. Provide watercraft equipped with appropriate data collection system(s) as well as personnel to operate the watercraft within local bodies of water for the purpose of collecting ground-based surface water data, while NASA LaRC personnel simultaneously use UAS asset(s) to collect airborne images.
4. Share with partner captured images from ground point of view, results of water sample data analyses, and scientific findings and interpretations that may be used to inform decision-making related to the use of UAS asset(s) for visually monitoring and collecting samples from bodies of water for HAB monitoring and surveillance.

ARTICLE 3. SCHEDULE AND MILESTONES

The planned major milestones for the activities for this Annex defined in the "Responsibilities" Article are as follows:

- | | |
|---|--|
| 1. NASA will operate its UAS asset(s) and collect airborne images of the Back River and/or the nexus of the Back River and the Chesapeake Bay. | Within one (1) month following Effective Date of Agreement |
| 2. ODU will supply and operate watercraft within the Back River and/or the nexus of the Back River and the Chesapeake Bay to collect surface water samples while overflights are conducted by NASA's UAS asset(s). | Within one (1) month following Effective Date of Agreement |
| 3. NASA and ODU will share data in the form of images (from the air and ground perspective), results of water sample analyses, and initial findings/interpretations related to the potential use of UAS asset(s) for visual monitoring of as well as direct collection of samples from bodies of water. | Within one (1) month following test collection date |

ARTICLE 4. FINANCIAL OBLIGATIONS

There will be no transfer of funds between the Parties under this Agreement and each Party will fund its own participation. All activities under or pursuant to this Agreement are subject to the availability of funds, and no provision of this Agreement shall be

interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, (31 U.S.C. § 1341).

ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS - DATA RIGHTS

A. Data produced under this Annex which is subject to paragraph C. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement will be protected for the period of one year.

B. Under paragraph H. of the Intellectual Property Rights - Data Rights Article of the Umbrella Agreement, Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data provided.

1. Background Data:

The Disclosing Party's Background Data, if any, will be identified in a separate technical document.

2. Third Party Proprietary Data:

The Disclosing Party's Third Party Proprietary Data, if any, will be identified in a separate technical document.

3. Controlled Government Data:

The Disclosing Party's Controlled Government Data, if any, will be identified in a separate technical document.

4. The following software and related Data will be provided to Partner under a separate Software Usage Agreement:

None

ARTICLE 6. TERM OF ANNEX

This Annex becomes effective upon the date of the last signature below ("Effective Date") and shall remain in effect until the completion of all obligations of both Parties hereto, or 18 months from the Effective Date, whichever comes first, unless such term exceeds the duration of the Umbrella Agreement. The term of this Annex shall not exceed the term of the Umbrella Agreement. The Annex automatically expires upon the expiration of the Umbrella Agreement.

ARTICLE 7. RIGHT TO TERMINATE

Either Party may unilaterally terminate this Annex by providing thirty (30) calendar days written notice to the other Party.

ARTICLE 8. POINTS OF CONTACT

The following personnel are designated as the Points of Contact between the Parties in the performance of this Annex.

Management Points of Contact

NASA Langley Research Center

Jennifer Viudez
Agreements Manager
Mail Stop: 264
Langley Research Center
Hampton, VA 23681
Phone: 757-864-5627
Fax: 757-864-8291
jennifer.m.hubble@nasa.gov

Old Dominion University

John Costulis
Deputy Director
Virginia Institute for Spaceflight and
Autonomy
Old Dominion University
411 Monarch Way
Norfolk, VA 23508-2559
Phone: 757-880-0402
Email: jcostuli@odu.edu

ARTICLE 9. MODIFICATIONS

Any modification to this Annex shall be executed, in writing, and signed by an authorized representative of NASA and the Partner. Modification of an Annex does not modify the terms of the Umbrella Agreement.

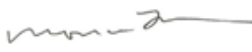
ARTICLE 10. SIGNATORY AUTHORITY

The signatories to this Annex covenant and warrant that they have authority to execute this Annex. By signing below, the undersigned agrees to the above terms and conditions.

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
LANGLEY RESEARCH CENTER

OLD DOMINION UNIVERSITY

BY: _____
Mary DiJoseph
Director, Aeronautics Research
Directorate


BY: _____
Dr. Morris Foster
Vice President for Research
Old Dominion University

DATE: _____

DATE: 17 August 2021